



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/930,738	08/15/2001	Richard B. Dyott	KVC-022.03	1992

25181 7590 04/30/2004

FOLEY HOAG, LLP  
PATENT GROUP, WORLD TRADE CENTER WEST  
155 SEAPORT BLVD  
BOSTON, MA 02110

EXAMINER

LEE, HWA S

ART UNIT PAPER NUMBER

2877

DATE MAILED: 04/30/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 09/930,738	Applicant(s) DYOTT, RICHARD B.	
	Examiner Andrew H. Lee	Art Unit 2877	<i>Am</i>

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
  - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
  - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
  - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 27 June 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 6, 7, 12, 13, 19, 24, 25 and 30-32 is/are rejected.
- 7) ☐ Claim(s) 2-5, 8-11, 14-18, 20-23 and 26-29 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

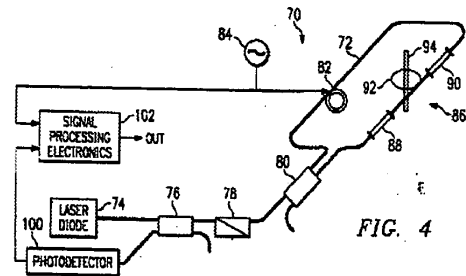
- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### DETAILED ACTION

#### *Claim Rejections - 35 USC § 103*

1. **Claims 1, 6, 13, 19, 24, 25, and 30-32** are rejected under 35 U.S.C. 103(a) as being unpatentable over Blake in view of Spillman, Jr. (4,564,289).

With regards to claims 1 and 9, Blake shows a fiber optic interferometric magnetic field sensor comprising:



- a) a source of linearly polarized light (74);
- b) a coil of single-mode optical fiber (92) having a first end, a second end, and one or more turns, the coil being deployed around a conductor (94) which is carrying an electric current to be sensed;
- c) a first transformer (88) of polarized light and a second transformer (90) of polarized light for transforming light between linearly polarized and circularly polarized states;
- d) a first directional coupler (80) for optically coupling the linearly polarized light from the source to the second ends of the transformers;
- e) an optical detector (100) for receiving the light beams which have traversed the coil and producing an output signal indicative of a magnetic field produced by the electric current; and
- f) a second directional coupler (76) for optically coupling to the optical detector light which has emerged from the coil, passed through the polarization transformers, and been rejoined by the first directional coupler.

Blake does not expressly show the transformer of polarized light having a twist through an angle about the central axis, said twist being at a distance from the first end of the birefringent fiber, the angle and distance chosen so that linearly polarized light entering said second end of the birefringent fiber exits the first end of the birefringent fiber effectively circularly polarized, the first end of said first transformer being coupled to the first end of the coil of single-mode fiber, and the first end of said second transformer being coupled to the second end of the coil.

Spillman, Jr. (Spillman hereinafter) shows an optical fiber sensor wherein Spillman teaches that polarization rotation can be achieved by "Another way of constructing the polarization rotator is to twist the fiber to obtain the desired amount of rotation."

At the time of the invention, one of ordinary skill in the art would have used a twisted fiber for the section that Blake shows a polarization transformer spliced into fiber system since Spillman teaches that all the various forms of optical fiber polarization transformers are functional equivalents and suggests that the twisted fiber can be twisted to any desired rotation thus being more adjustable or tunable to the desired rotation.

With regards to claim 31, the limitation drawn to the method of making the fiber does not further limit the structure of claim 1, and thus has not been given any patentable weight.

**Claims 7 and 12** are rejected under 35 U.S.C. 103(a) as being unpatentable over Blake in view of Spillman, as applied similarly to claim 1 above, except that it also would have been obvious to one of ordinary skill (as applicant agrees, in spec. p. 17 lines 4-11) that the location of the detector could be changed for motivation of optimizing the design as desired.

***Allowable Subject Matter***

2. Claims 2-5, 8-11, 14-18, 20-23, 26-29 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

3. The following is a statement of reasons for the indication of allowable subject matter: Although the prior art of record in combination would suggest the use of a polarization controller having a twist in order to rotate a linear polarization to circular polarization and also in reciprocal, the prior art of record fails to show or to suggest the distance from the twist to the first end of the birefringent fiber being approximately an odd multiple of one quarter of a beatlength.

***Response to Arguments***

4. Applicant's arguments with respect to claims 1-30 have been considered but are moot in view of the new ground(s) of rejection.

Papers related to this application may be submitted to Technology Center (TC) 2800 by facsimile transmission. Papers should be faxed to TC 2800 via the PTO Fax Center located in CP4-4C23. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (November 15, 1989). The CP4 Fax Center number is 703-872-9306 for regular communications and for After Final communications.

If the Applicant wishes to send a Fax dealing with either a Proposed Amendment or for discussion for a phone interview then the fax should:

a) Contain either the statement "DRAFT" or "PROPOSED AMENDMENT" on the Fax Cover Sheet; and

Art Unit: 2877

b) Should be unsigned by the attorney or agent.

This will ensure that it will not be entered into the case and will be forwarded to the examiner as quickly as possible.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew Hwa Lee whose telephone number is (571) 272-2419.

The examiner can normally be reached on M-Th. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank Font can be reached on (571) 272-2415.

A handwritten signature in black ink, appearing to read 'Andrew Lee', with a stylized, flowing script.

Andrew Lee  
Patent Examiner  
Art Unit 2877

April 15, 2004/ahl